



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,635	01/02/2002	Charles T. Black	YOR9-2001-0319-US1	9290
7590 03/29/2004				
McGinn & Gibb, PLLC Suite 200 8321 Old Courthouse Road Vienna, VA 22182			EXAMINER JOHNSTON, PHILLIP A	
			ART UNIT 2881	PAPER NUMBER

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/039,635	Applicant(s) BLACK ET AL.	
	Examiner Phillip A Johnston	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Detailed Action

Examiners Response to Arguments

1. Applicants arguments are moot in view of new grounds for rejection.
2. This Office Action is submitted in response to Amendment dated 1-29-2004, wherein Claims 1,10, and 24-28 have been amended. Claims 1-36 are pending.

Claims Rejection – 35 U.S.C. 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2003/0106998 to Colbert, in view of Requicha, U.S. Patent No. 6,508,979.

Regarding Claims 1, 7-10,16-18 and 24-28 Colbert (998) discloses

- (a) Attaching a single nanotube to the apex of an SPM probe tip
- in FIG. 1E a typical STM or AFM probe having a cantilever 180, which has a conventional tip 182 and a nanotube assembly 184 (in this case a single

Art Unit: 2881

nanotube) extending from the tip (apex). The nanotube assembly 184 may be attached to the tip 182 in the same fashion discussed earlier. The cantilever 180 can be used as a part of a larger device in the known manner. A coating, as described above, may be applied to the probe and the mounting element. See paragraphs [0065],[0056] and Figure 1E; below;

(b) Dipping the tip into a layer of nanotubes. See paragraph [0053].

(b) Sticking (attaching) the nanotubes to the probe tip via van der Waals forces and covalently bonded. See paragraphs [0012] and [0052].

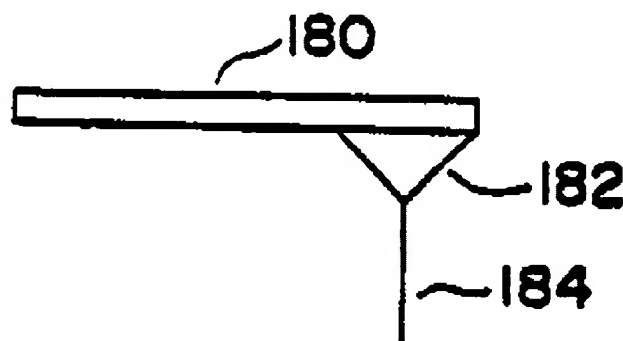


FIG. 1E

Colbert (998) as applied above does not disclose the attachment of nanoparticles to the SPM, as recited in Claims 1, 10, and 24-28. However, Requicha (979) discloses in FIG. 2A, a first nanolayer 200 is constructed by depositing a large number of substantially similar nanoparticles 202 on the substrate surface 204. The particles 202 are on the order of about a few nanometers "nanoscale". These particles 202 are referred to as nanoparticles. The nanoparticles 202 may be manipulated with a scanning probe microscope (SPM). Manipulation of the nanoparticles 202, referred to as nanomanipulation, includes pushing and/or pulling of the nanoparticles 202 with the tip of the SPM to the desired locations. The nanomanipulation may also include positioning and linking of the nanoparticles 202. The resulting nanolayer 200 includes a collection of nanoparticles 202 that are in contact with adjacent nanoparticles 202. See Column 2, line 31-50.

Therefore it would have been obvious to one of ordinary skill in the art that the nanoscale apparatus and method of Colbert (998) can be modified to use nanoparticles in accordance with Requicha (979), to deposit nanoparticles on a substrate, such as an AFM tip.

Regarding Claims 3-6, 14, 15, 19-21, Colbert (998) discloses;

(a) The use of catalytic nanoparticles as recited in Claim 3, in the mixtures for producing nanotubes. See paragraphs [0162] and [0180].

(b) The use of organic coatings, and adhesive coatings as recited in Claims 4-6. See paragraphs [0055] - [0059].

(c) Dipping the tip in solution as recited in Claims 11-14, and 19, and 20. See paragraph [0056] and [0057].

Regarding Claims 22 and 23, Colbert (998) in view of Requicha (979) discloses the claimed invention {see paragraph [0011] in Colbert (998)}, except for the use of annealing to make an electrically continuous film, as recited in Claims 22 and 23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use annealing for transforming a layer of nanoparticles into an electrically continuous film, since it has been held that omission of an element and its function in a combination where the remaining elements perform the same function as before involves only routine skill in the art. In re Karlson, 130 USPQ 184.

Regarding Claims 30-36, Requicha (979) discloses spherical nanoparticles in Column 2, line 40-49.

5. Claims 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Pub. No. 2003/0106998 to Colbert, in view of Requicha, U.S. Patent No. 6,508,979, and in further view of Natan, U.S. Patent No. 6,025,202.

Regarding Claims 15 and 19, Colbert (998) in view of Requicha (979) does not disclose the use of spherical nanoparticles. However, Natan (202) discloses a biosensor based on complexes between biomolecule receptors and colloidal Au nanoparticles, and more specifically, colloid layers of receptor/Au complexes that can be used to detect biomolecule analytes through measuring of binding-induced changes in electrical resistance or surface plasmon resonance.

Gold nanoparticles were deposited on the substrate using, an electrolyte solution of 1 mM Ag_2SO_4 and 0.1 M Na_2SO_4 was degassed with N_2 for at least 15 minutes prior to the electrochemical deposition. A Pt gauze electrode was used as a counter electrode. See Abstract and Column 21, line 9-19

Therefore it would have been obvious to one of ordinary skill in the art that the nanoscale apparatus and method of Colbert (998) in view of Requicha (979) can be modified to use an electrolyte solution in accordance with Requicha (979), to deposit nanoparticles on a substrate.

Conclusion

6. The Amendment filed on 1-29-2004 has been considered but the arguments are moot in view of new grounds for rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2881


extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

March 11, 2004


JOHN R. LEE
SUPERVISOR PATENT EXAMINER
TECHNOLOGY CENTER 2000